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Diurnal sap flow measurements and climatic responses of a species growing in a Mediterranean shrub land

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The ecological distribution of vegetation types are regulated by climatic conditions and precipitation is one of the most significant components driving the occurrence and diversity of species. Long-term monitoring and understanding plant responses to rapid changing environmental conditions are crucial for exploring community dynamics and evaluating the exposure of species to changes in the climate. In an attempt to assess the resilience of the Mediterranean woody shrub, *P. repens* to drought and temperature, the result of changes in temperature and moisture regime on the photosynthetic capacity and transpiration dynamics (hydraulic response), by monitoring chlorophyll fluorescence and diurnal monthly sap flow rates, non-destructively of plants in situ over a climate gradient at different times of the year at Jonaskop, Western Cape. Temperature, vapor pressure, RH and soil moisture were monitored concomitantly. Changes in stem sap flow rates were measured at hourly intervals with relative rate sap flow sensors interfaced with loggers installed on the same terminal branches of *P. repens* at each site along the climate gradient. The sensors were mounted on woody stems ranging from 1-5 mm in diameter. A portable modulated fluorimeter calculated the effective quantum yields of PSII (ΔF/Fm´) in 30 minute dark-adapted *P. repens* leaves. *P. repens* L. displayed significantly negative correlations between their total daily amplitudes in sap flow and station maximum daily temperature both in winter, spring, summer and autumn. The leaves of *P. repens* L. displayed significantly negative correlations between their total daily amplitudes in sap flow and photosynthetic effective quantum yield (ΔF/Fm´) at the 5 stations along the gradient during the months of October and November.

Biography

Judith Lize Arnolds holds an MSc degree in Environmental Science from the North West University, South Africa and has just submitted her PhD. She is a scientist at the South African National Biodiversity Institute in Cape Town, South Africa and is involved in climate change research.

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